

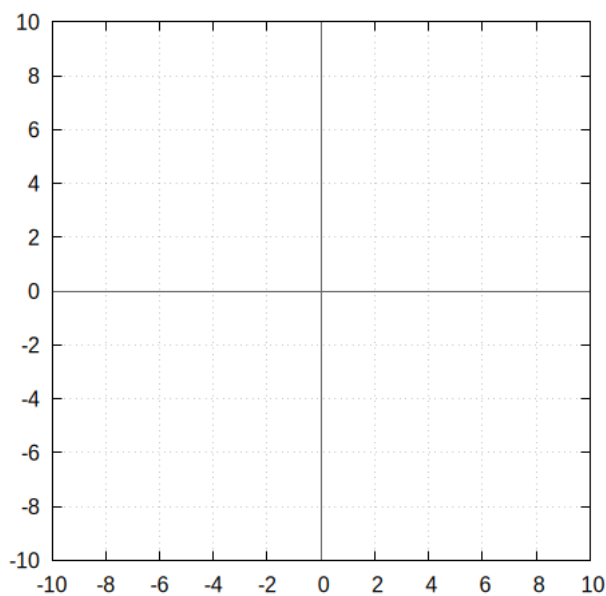
3.1 Introduction to Logarithms and Review of Exponentials Worksheet

This document was composed and formatted by Annie Bernatchez.

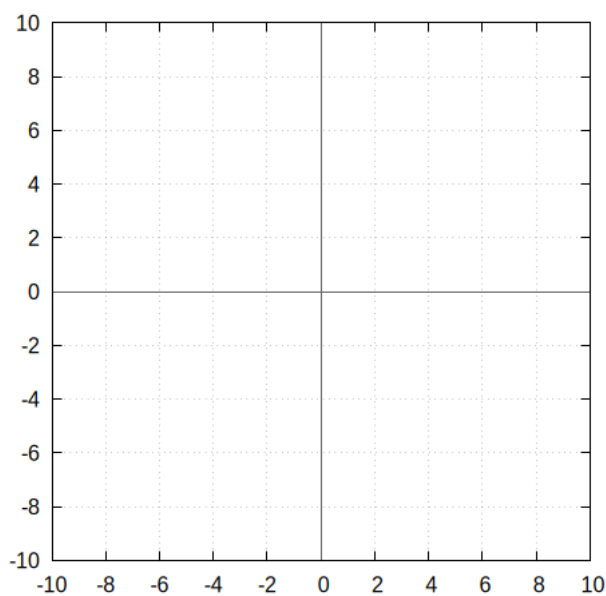
The course material originated from www.jensenmath.ca

1) Sketch a graph of each function. Then, sketch a graph of the inverse of each function. Label each graph with its equation.

a) $y = 2^x$

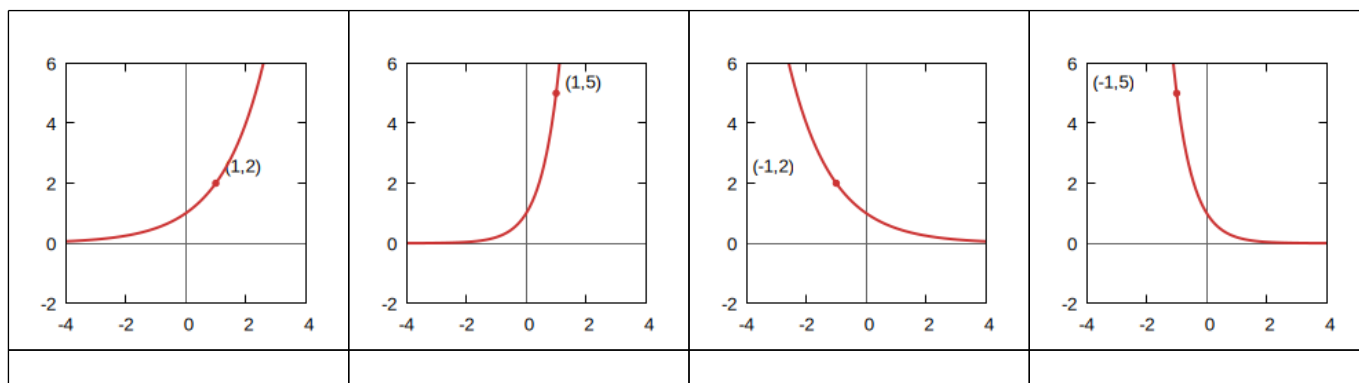


b) $y = 4^x$



2) Match each equation to its corresponding graph.

A) $y = 5^x$ B) $y = \left(\frac{1}{2}\right)^x$ C) $y = 2^x$ D) $y = \left(\frac{1}{5}\right)^x$



3) An influenza virus is spreading according to the function $N = 10(2)^t$, where N is the number of people infected and t is the time, in days.

a) How many people have the virus at each time?

i) initially, when $t = 0$

ii) after 1 day

iii) after 2 days

iv) after 3 days

b) After how many days will 40 960 people be infected?

4) Rewrite each equation in logarithmic form

a) $4^3 = 64$

b) $128 = 2^7$

c) $5^{-2} = \frac{1}{25}$

d) $\left(\frac{1}{2}\right)^2 = 0.25$

e) $6^x = y$

f) $10^5 = 100\,000$

g) $\frac{1}{27} = 3^{-3}$

5) Evaluate each logarithm

a) $\log_2 64$

b) $\log_3 27$

c) $\log_2 \left(\frac{1}{4} \right)$

d) $\log_4 \left(\frac{1}{64} \right)$

e) $\log_5 125$

f) $\log_2 1024$

6) Evaluate each common logarithm

a) $\log 1000$

b) $\log \left(\frac{1}{10} \right)$

c) $\log 1$

d) $\log 0.001$

e) $\log 10^{-4}$

f) $\log 1\,000\,000$

7) Rewrite in exponential form

a) $\log_7 49 = 2$

b) $5 = \log_2 32$

c) $\log 10\,000 = 4$

d) $w = \log_b z$

e) $\log_2 8 = 3$

f) $-2 = \log\left(\frac{1}{100}\right)$

Answer Key

2) C, A, B, D

3) a) i) 10 ii) 20 iii) 40 iv) 80 b) 12 days

4) a) $\log_4 64 = 3$ b) $\log_2 128 = 7$ c) $\log_5\left(\frac{1}{25}\right) = -2$ d) $\log_{\frac{1}{2}} 0.25 = 2$ e) $\log_6 y = x$ f) $\log_{10} 100\,000 = 5$ g) $\log_3\left(\frac{1}{27}\right) = -3$

5) a) 6 b) 3 c) -2 d) -3 e) 3 f) 10

6) a) 3 b) -1 c) 0 d) -3 e) -4 f) 6

7) a) $7^2 = 49$ b) $2^5 = 32$ c) $10^4 = 10\,000$ d) $b^w = z$ e) $2^3 = 8$ f) $10^{-2} = \frac{1}{100}$